A Simple BGP-based Mobile Routing System for the Aeronautical Telecommunications Network

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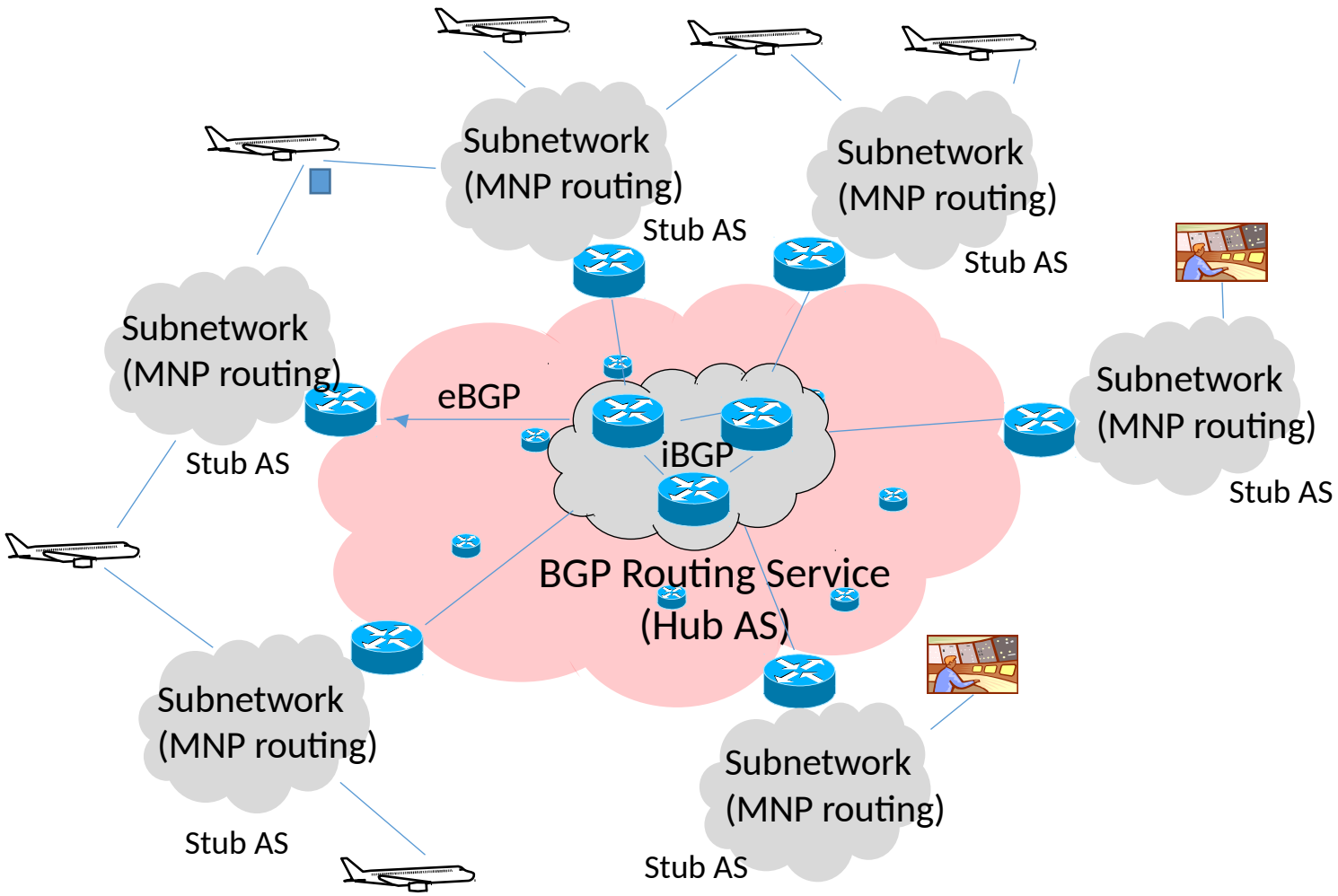
Background

- International Civil Aviation Organization (ICAO) building an IP-based networking system for worldwide Air Traffic Management (ATM)
- Developing the Aeronautical Telecommunications Network with Internet Protocol Services (ATN/IPS)
- Under development in ICAO Working Group I (WG-I)
- IPv6-based; mobility capable
- Accommodates aircraft with multiple data links
  - SATCOM
  - LDACS
  - VHF
  - etc.

Mobility Subgroup Solution Discussion

- Looking at three candidate mobility solutions:
  - PMIP
  - Ground-based LISP
  - BGP-based overlay (subject of this document)
- A Simple BGP-Based Mobile Routing System for the Aeronautical Telecommunications Network
- BGP overlay network – does not interact with the global public Internet BGP routing system
- Based on a “hub and spokes” arrangement with stub ASBRs in data link provider subnetworks and core ASBRs in center of network
- s-ASBRs advertise and withdraw airplane Mobile Network Prefixes (MNPs)
- c-ASBRs in a hub AS forward packets between s-ASBRs
- Route optimization removes c-ASBRs from path

ATN/IPS With BGP



BGP Details

- S-ASBRs advertise their associated MNPs to c-ASBRs
- C-ASBRs originate “default”, but DO NOT advertise any MNPs to S-ASBRs
- Each stub subnetwork is assigned a MED metric
- C-ASBRs disable AS_PATH selection and select routes based on MED
- Means that packets may take a longer path in order to reach a stub network with a lower MED value
- Reason: some data links are preferred over others (airplane should use SATCOM as first alternative and fail over to other links if necessary)
- SYSTEM ENSURES THAT THERE WILL ALWAYS BE A WORKING ROUTE
- Have working network model – demonstrations on request

Draft Status

- https://datatracker.ietf.org/doc/html/draft-templin-atn-bgp
- Will be presented at ICAO WG-I mobility subgroup in Montreal week of May 15